User's Manual

Sapphire Pure Black X79N

Intel X79 / LGA 2011 Mainboard

TRADEMARK

All products and company names are trademarks or registered trademarks of their respective holders.

These specifications are subject to change without notice.

Manual Revision 1.0

November 14, 2011

Federal Communications Commission (FCC) Statement

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions contained in this manual, may cause harmful interference to radio and television communications. However, there is no guarantee that interference will not occur in a particular installation.

If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the product into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note1: Connecting this device to peripheral devices that do not comply with Class B requirements, or using an unshielded peripheral data cable, could also result in harmful interference to radio or television reception

Note2: The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this product.

Note3: To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables

CE: Radiation of EN 55022 & Immunity of EN 55024

Waste Electrical and Electronic Equipment (WEEE) Statement

To protect the global environment, this product must be sent to separate collection facilities for recovery and recycling.

DISPOSAL

Do not dispose of this product as unsorted municipal waste. Collect such waste separately for special treatment.

Table of Contents

Chapter 1 Introduction 1
1-1 Mainboard Specifications 1
1-2 Package Contents 4
1-3 Mainboard Layout 5

Chapter 2 Installation 9
2-1 Before You Begin 9
2-2 Installing the I/O Shield 9
2-3 Securing to the Chassis 9
2-4 Installing the CPU and Cooler 10
2-5 Installing System Memory 11
Memory configurations 12
Memory Installation 12
2-6 Installing Expansion Cards 13
2-7 Connecting Cables 15
Connecting Power Supply Cables 15
Connecting Serial ATA (SATA) Cables 16
Connecting to the Internal Headers and Connectors 17
Front Panel Header 17
USB2.0 Headers 18
USB3.0 Headers 18
CFPA Header 19
S/PDIF Header 19
Serial Port Header 19
2-8 Diagnostics LED 21
2-9 LED Status Indicators 21
2-10 Onboard Buttons 21
Clear CMOS Button 22
Reset and Power Button 22
2-11 Dual BIOS Switch 23

Chapter 3 Configuring the BIOS 24
3-1 Select Boot Device 24
3-2 Enter BIOS Setup 24

3-3 Main Menu 26
3-4 Performance Menu 27
CPU Configuration 29
Memory Configuration 30
Voltage Configuration 32
3-5 Advanced Menu 34
ACPI Settings 35
CPU Configuration 36
CPU Information 37
SATA Configuration 38
USB Configuration 39
Super IO Configuration 40
Serial Port 0 Configuration 40
H/W Monitor 41
Smart Fan Configuration 42
Onboard Device Configuration 43
3-6 Chipset Menu 45
3-7 Boot Menu 46
3-8 Security Menu 47
3-9 Save & Exit Menu 48

Chapter 4 Driver Installation 50
4-1 Driver Install 50
4-2 TRIXX Utility 51
4-3 Hardware monitor gadget 52
4-4 S_BIOS Flash Utility 53

Chapter 5 POST Code 58

Chapter 1 Introduction

1-1 Mainboard Specifications

CPU

- Supports Intel® Core i7 3900 and 3800 series processor in LGA2011 package
- Supports Intel® Turbo Boost technology, Hyper-Threading technology

Chipset

- Intel® X79 with NVIDIA nF200 PCI-E bridge

System Memory

- Four 240-pin DDR3 SDRAM DIMM sockets
- Supports 1.5v DDR3-1066/ 1333/ 1600+ DIMMs with quad channel architecture
- Supports x16 and x8 DIMMs, non-ECC, unbuffered DIMMs
- Supports up to 32GB system memory

USB Ports

- From Intel® X79 chipset:
  - Ten USB 2.0 ports (six at rear panel, four onboard headers), supporting transfer speed up to 480Mbps
- From Asmedia USB 3.0 controller:
  - Six USB 3.0 ports (four at rear and two onboard headers) backward compatible with USB 2.0, supporting transfer speeds up to 4.8Gbps
- Supports wake-up from S1, S3 and S4 modes
- Support power charge function
  - Front panel 2 USB 3.0 ports also support power charge function under S5 mode

SATA Ports

- From Intel® X79 chipset:
  - Two SATA3 ports with 6Gb/s data transfer rate and four SATA2 ports with 3Gb/s data transfer rate
  - Supports RAID 0, 1, 10 and 5 functions
  - Supports AHCI (Advanced Host Controller Interface)

- From Marvell 88SE9128 controller:
  - Two SATA3 ports with 6Gb/s data transfer rate with RAID 0 and 1
  - Supports AHCI (Advanced Host Controller Interface)
- From Marvell 88SE9172 controller:
  - Two eSATA3 ports at rear port
  - Supports AHCI (Advanced Host Controller Interface)

Onboard LAN

- Dual Gigabit Ethernet from Marvell 88E8057 Gigabit controller

Bluetooth

- Atheros AR3011 is a highly integrated, all-CMOS, single chip with Bluetooth® 2.1 + EDR supported

Onboard Audio

- Supports 8-channel High-Definition audio from Realtek ALC892 codec
- Supports rear panel Optical S/PDIF output
- Supports Jack-detection function

Expansion Slots

- Six PCI-Express 2.0 x16 slots with PCI-E Slot Disable/Enable Jumper
- PCI-E slot 1 and PCI-E slot 2 are PCI-E Gen3 ready
- Supports ATI® CrossFireX™ Technology

  * Please refer to detail configuration at 2-6 Installing Expansion Cards

I/O

- Onboard Fintek F71889A LPC bus I/O controller
- Supports Hardware Monitoring for fan speed, CPU and system temperature

Back Panel I/O Ports

- 1 x PS/2 Keyboard/Mouse port
- 6 x USB 2.0 ports
- 1 x Coaxial S/PDIF Out connector
- 1 x Optical S/PDIF Out connector
- 1 x Bluetooth
- 2 x eSATA ports

- 2 x RJ45 LAN ports
- 4 x USB 3.0 ports
- 6 Audio jacks

Internal I/O Connectors

- 1 x 24-pin ATX power connector
- 1 x 8-pin ATX 12V power connector
- 1 x 6-pin PCI-E power connector
- 4 x SATA3 connectors (two from Intel X79 chip and two from Marvell 88SE9128 chip)
- 4 x SATA2 connectors
- 4 x USB2.0 headers
- 2 x USB3.0 headers
- 1 x Front Panel header
- 1 x S/PDIF header
- 1 x Front Audio header
- 1 x Serial Port header
- 1 x 4-pin CPU Fan header
- 5 x 3-pin Fan header

BIOS

- 64Mb SPI Flash with AMI based BIOS
- User Friendly graphics interface QBIOS (Quick Control UEFI BIOS)
- S_BIOS easily update and back up at BIOS control panel
- Supports ACPI (Advanced Configuration and Power Interface)
- Dual BIOS switch with on board indicator LEDs

Special Features

- Onboard diagnostic 7-Segment LED with CPU temperature display
- Onboard buttons include Clear CMOS, RESET and POWER
- Supports CPU Power Vcore Load-line adjust function
- Supports Windows based OC utility "Trixx" and Win7 HW monitor gadget tool
- USB power charge utility supports all USB ports under Windows 7
- Server Grade Digital 6+1 phase power (Vcore and Vsa)
- Vtt 2 and VDIMM 2+2 phase power design

Form Factor

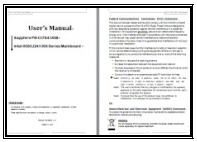
- ATX form factor of 305mm x 245mm

Operating systems:

- Supports Windows Vista and Windows 7

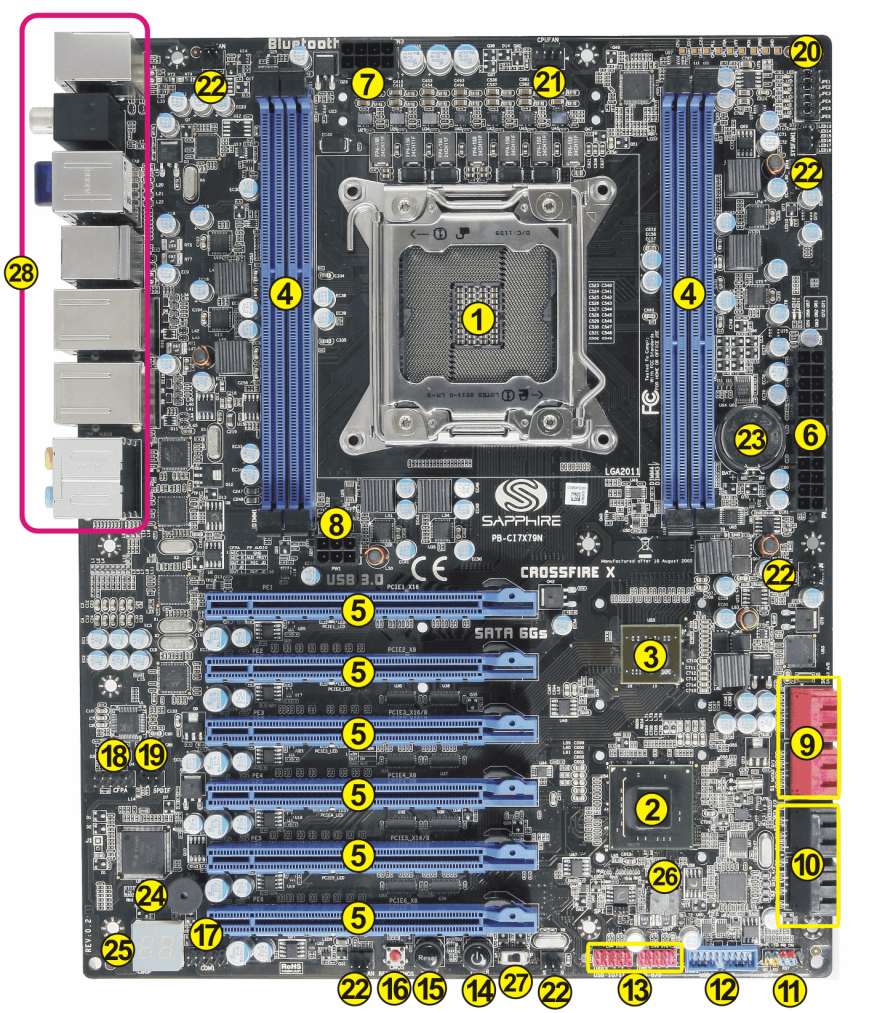
1-2 Package Contents

Your Sapphire mainboard comes with the following accessories.

1. Mainboard	2. I/O Shield
3. Quick Installation Guide	**4. Driver CD**
	
5. USB3.0 Front Panel Cable (Optional)	**6. SATA Data Cable *8**

1-3 Mainboard Layout

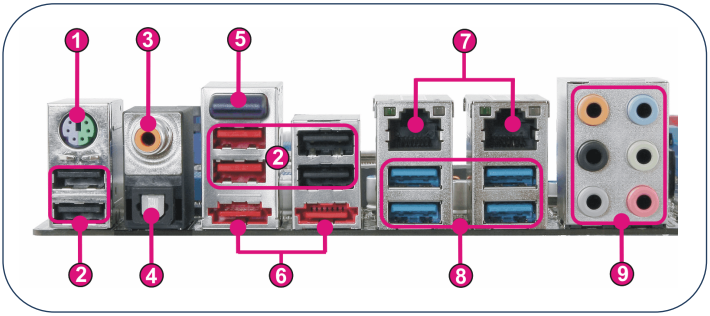
The following figure shows the location of components on the mainboard. See following page for description.



Item	Component description
1	CPU Socket 2011
2	Intel X79 Chip
3	NVIDIA nF200 Chip
4	DDR3 DIMM Slots 1-4
5	PCI-E 2.0 x16 Slot *6
6	24-Pin ATX Power Connector
7	8-pin ATX_12V Power Connector
8	6-pin PCI-E Power Connector
9	SATA3 Connectors *4
10	SATA2 Connectors *4
11	Front Panel Header
12	USB 3.0 Header *2
13	USB 2.0 Header *4
14	Power Button
15	Reset Button
16	Clear CMOS Button
17	Serial port Header
18	Front Panel Audio Header
19	S/PDIF Header
20	PCI-E Slot Control Jumper
21	CPU Fan Header
22	3-pin Fan Header *5
23	Mainboard Battery
24	PC Speaker
25	Debug LED Display
26	64Mb SPI Flash
27	Dual BIOS Switch
28	Back Panel Connectors (see below for detail)

I/O Back Panel

The I/O back panel for this mainboard is shown below. When installing the mainboard into the computer case, use the bundled I/O shield to protect this back panel.



1. PS/2 Keyboard/Mouse Port
   This connector is used for a keyboard or mouse. You can plug a PS/2 keyboard or mouse directly into this connector.

2. USB 2.0 Ports (six)
   The mainboard provides an OHCI (Open Host Controller Interface) Universal Serial Bus root for attaching USB devices such as a keyboard, mouse or other USB-compatible devices. Supports data transfer rates up to 480Mb/s.

3. Coaxial S/PDIF-Out
   This SPDIF (Sony & Philips Digital Interconnect Format) connector is used for digital audio transmission to external speakers/amplifier through a coaxial cable.

4. Optical S/PDIF-Out
   This SPDIF (Sony & Philips Digital Interconnect Format) connector is used for digital audio transmission to external speakers/amplifier through an optical fiber cable.

5. Bluetooth
   Bluetooth wireless technology is an interface intended for wireless control/data communication

6. eSATA Port (two)
   The eSATA (External SATA) port provides connection to eSATA hard drives.

7. Dual LAN Ports with LEDs
   The mainboard provides two standard RJ-45 jacks for connecting to a Local Area Network (LAN). Two LEDs are built into the RJ-45 LAN connector. These LEDs indicate the status of the LAN.

LED	LED Color	LED state	Indicates
A	Green	Off	LAN link is not established
		On	LAN link is established
		Blinking	LAN activity is occurring
B	N/A	Off	10 Mb/s data rate
	Green	On	100 Mb/s data rate
	Yellow	On	1000 Mb/s data rate

8. USB 3.0 ports (four)
   USB 3.0 ports are backward compatible with USB 2.0 devices. Supports data transfer rates up to 4.8Gb/s (SuperSpeed).

9. Audio ports
   This mainboard provides 2, 6 or 8 channel audio. It is easy to differentiate between the audio functions by referring to the color of the jacks.

Ports	2 channel	6 channel	8 channel
Blue	Line-In	Line-In	Line-In
Lime	Line-Out	Front Stereo-Out	Front Stereo-Out
Pink	Min-In	Min-In	Min-In
Orange	--	Center/Subwoofer	Center/Subwoofer
Black	--	Rear Stereo-Out	Rear Stereo-Out
Gray	--	--	Side Stereo-Out

Chapter 2 Installation

2-1 Before You Begin

Please take note of all precautions before you install anything on to the mainboard or change any of the mainboard settings.
Turn off the power to your system and discharge your body's static electric charge by touching a grounded surface—for example, the metal surface of the power supply—before performing any hardware procedure.
The manufacturer assumes no liability for any damage, caused directly or indirectly, by improper installation of any components by unauthorized service personnel. If you do not feel comfortable performing the installation, consult a qualified computer technician.
Damage to system components, the mainboard, and injury to you may result if power is applied during installation.

2-2 Installing the I/O Shield

The mainboard comes complete with an I/O shield. When installed in the chassis, the shield blocks radio frequency transmissions, protects internal components from dust and foreign objects, and promotes correct airflow within the chassis.

Install the I/O shield before installing the mainboard in the chassis. Place the shield inside the chassis. Press the shield into place so that it fits tightly and securely. If the shield does not fit, obtain a properly sized shield from the chassis supplier.

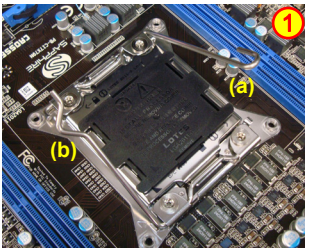
2-3 Securing to the Chassis

When installing the mainboard, you have to secure the mainboard into the chassis by fastening with nine screws. Please refer to your chassis manual for instructions.

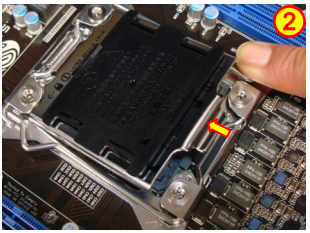
2-4 Installing the CPU and Cooler

Follow the steps below to install the CPU & cooler correctly.

1. Open the hinge lever (a) then fully open the active lever (b).

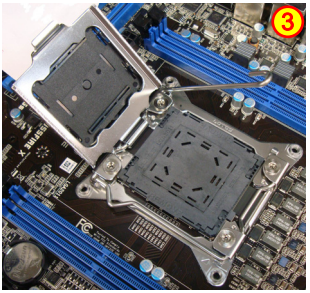


2. Open the load plate by pushing down on the hinge lever to raise the load plate and Grasp the tab.

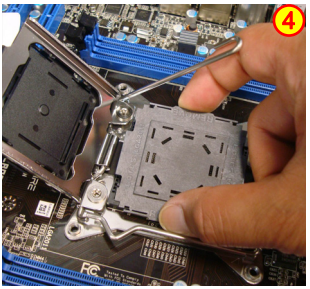


3. Open load plate to fully open position.

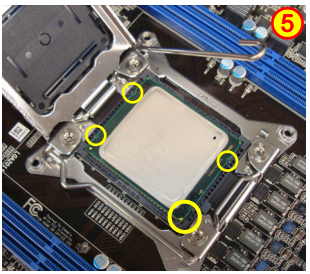
4. Remove the protective socket cover from the socket. **Do not touch the CPU socket contacts to avoid damaging.**



Note:
Do not discard the protective socket cover. Be sure to always replace the cover unless the CPU is installed.

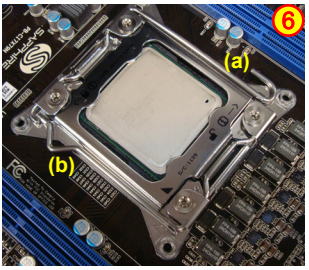


5. Align the CPU pin one (small triangle marking) and CPU notches. Place CPU straight down without tilting or sliding it.

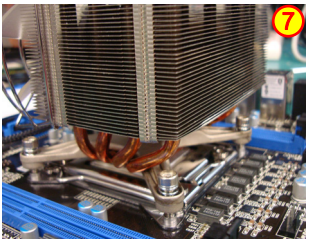


6. Close the load plate and close the active lever (b) then close the hinge lever (a).

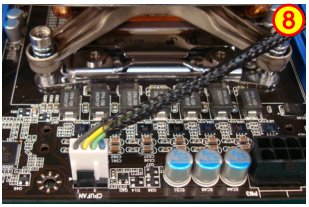
Note:
Apply some thermal paste onto the surface of the CPU for better heat dispersion.



7. To install the fan cooler, align the four holes on the CPU socket. Fasten the cooler onto the nut with four screws. If in doubt, always refer to the CPU cooler manual for further instructions.



8. Connect the 4-wire fan cable to the 4-pin CPU FAN header on the mainboard.



Note:
Pictures are for installation reference only, actual boards may be slightly different.

2-5 Installing System Memory

This mainboard has four 240-pin DIMM sockets for DDR3 memory. These slots support 1GB, 2GB, 4GB and 8GB DDR3 DIMMs up to max. 32GB

Make sure that you install memory modules of the same type and density in the different channel DIMM slots for Dual-Channel mode.

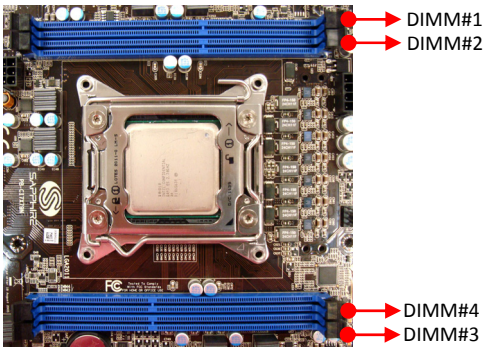
There must be at least one memory bank populated to ensure normal operation and you can insert the memory module into any of the DIMM slots.

Memory configurations

Use the following the recommendations for installing memory.

DIMM Quantity / Location	1 DIMM (Single Channel)	2 DIMMs (Dual Channel)	3 DIMMs (Triple Channel)	4 DIMMs (Quad Channel)
DIMM#1	V	V	V	V
DIMM#2	--	--	V	V
DIMM#3	--	V	V	V
DIMM#4	--	--	--	V

(" V" = Memory installed, "--" = No memory installed)



Memory Installation

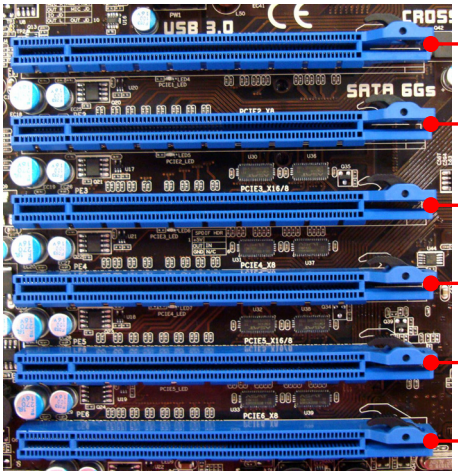
DDR3 and DDR2 memory modules are physically different. Please only install DDR3 DIMMs in this mainboard.

To install the DIMM, follow these steps:

1. Pull both clips on either side of the slot outwards. Align the DIMM module with the slot.
2. Press modules straight down until the plastic clips close and the module fits tightly into the DIMM slot. Push clips inwards to make sure they are in place and the memory is securely fitted.

2-6 Installing Expansion Cards

The mainboard provides six PCI Express 2.0 x16 slots that comply with the PCI Express specifications. The PCI-E slot 1 and 2 are PCI-E Gen3 ready.



PCIE1_X16 (Gen3 ready)
PCI-E2.0 x16 slot (with x16 link)

PCIE2_X8 (Gen3 ready)
PCI-E2.0 x16 slot (with x8 link)

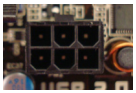
PCIE3_X16/X8
PCI-E2.0 x16 slot (with x16/x8 link)

PCIE4_ X8
PCI-E2.0 x16 slot (with x8 link)

PCIE5_X16/X8
PCI-E2.0 x16 slot (with x16/x8 link)

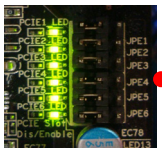
PCIE6_X8
PCI-E2.0 x16 slot (with x8 link)

These PCI-E slots with LED indicating the activity status. When the PCI-E slot is powered on, the LED is on.

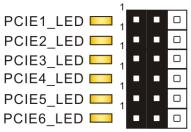


Note:
When installing multiple graphic cards in PCIE3 to PCIE6, you **must** connect power supply to 6-pin PCI-E power connector to ensure sufficient power supply to the PCI-E slots, otherwise they don't work.

This motherboard has a special PCI-E slot control jumper, allows you to quickly enable or disable specific PCI-E slot action, do not remove the PCI-E slot. This jumper also with LED indicates the activity status of accordingly PCI-E slot.



PCI-E Slot Disable/Enable Jumper



Settings:
1-2: Enable (Default) (PCI-E slot is active)
2-3: Disable (PCI-E slot is not active)

Please refer to PCI Express card configuration table.

Slot	Channel	Bandwidth
PCIE1	CPU x16	G2 x16 (Gen3 ready)
PCIE2	CPU x8	G2 x8 (Gen3 ready)
PCIE3	nF200 CHA x16/x8	G2 x16/x8
PCIE4	nF200 CHA x8	G2 x8
PCIE5	nF200 CHB x16/x8	G2 x16/x8
PCIE6	nF200 CHB x8	G2 x8

The design of this motherboard supports AMD CrossFireX™ technology for support of multiple graphic cards. Please refer to the location of slots and recommended configuration table for PCI-E operating mode to get the best performance possible.

Recommended configuration table			
Slot location / VGA card	**PCIE1**_x16	**PCIE3**_x16/x8	**PCIE5**_x16/x8
1 VGA card	x16		
2 VGA cards	x16		x16
3 VGA cards	x16	x16	x16

Installing a PCI Express card:

1. Place the card in an available PCI Express slot and press down on the card until it is completely seated in the slot. If the card is not seated properly, it could cause a short across the pins.
2. Secure the card's metal bracket to the back panel of the chassis with a screw.

2-7 Connecting Cables

This section takes you through all the necessary connections on the mainboard.

Connecting Power Supply Cables

- 24-pin ATX Power

PW2 is the main power supply connector. Make sure that the power supply cable pins are properly aligned with the connector on the mainboard. Firmly plug the power supply cable into the connector and make sure it is secure.

Note:
If you'd like to use 20-pin ATX power supply, please plug in your power supply cable aligned with pins 1 & 13. The 24-pin main power connector is backwardly compatible with ATX power supplies with 20-pin connectors.

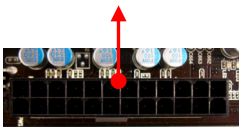
- 8-pin ATX 12V Power

PW3, the 8-pin ATX 12V power connector, is used to provide power to the CPU. Align the power plug to the connector and press firmly until seated.

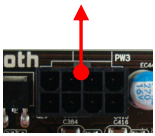
- 6-pin PCI-E Power

PW1, the 6-pin PCI-E power connector, is used to provide extra 12V power for PCI-E slots PCIE3 to PCIE6. When installing multiple graphic cards in PCIE3 to PCIE6, you **must** connect power supply here to ensure sufficient power supply to the PCI-E slots, otherwise they won't work.

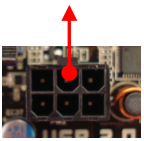
24-pin ATX Power connector



8-pin ATX Power connector



6-pin PCI-E Power connector



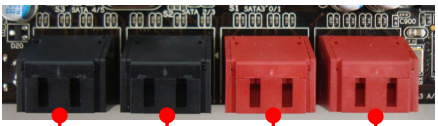
Connecting Serial ATA (SATA) Cables

SATA cables support the Serial ATA protocol. Each cable can be used to connect one SATA drive to the mainboard.

The S1 to S3 connectors are controlled by the Intel X79 chip and support RAID 0, 1, 10, 5 functions.

S1 works at speeds of up to 6 Gb/s, S2 and S3 works at speeds of up to 3 Gb/s.

The S6 connectors are controlled by the Marvell 88SE9128 chip and work at speeds of up to 6 Gb/s.

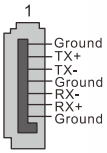


S3: SATA 2.0
SATA 4 (bottom)
SATA 5 (top)

S2: SATA 2.0
SATA 2 (bottom)
SATA 3 (top)

S1: SATA 3.0
SATA3 0 (bottom)
SATA3 1 (top)

S6: SATA 3.0
SATA3 A (bottom)
SATA3 B (top)



Attach one end of the SATA cable to one of the SATA connectors on board and attach the other end of the cable to the SATA drive

Connecting to the Internal Headers and Connectors

Front Panel Header

The front panel header on this motherboard is used to connect the front panel switches and LEDs.

▶PWR_LED

Attach the front panel power LED cable to these two pins of the connector. The Power LED indicates the system's status.

System Status	Power LED indicates
On	The LED is on
Off	The LED is off
S1	The LED is on
S3	The LED will blink
S4	The LED is off

▶PW_ON

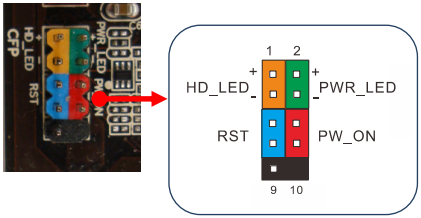
Attach the power button cable from the case to these two pins. Pressing the power button on the front panel turns the system on and off rather than using the onboard button.

▶HD_LED

Attach the hard disk drive indicator LED cable to these two pins. The HDD indicator LED indicates the activity status of the hard disks.

▶RESET

Attach the Reset switch cable from the front panel of the case to these two pins. The system restarts when the RESET switch is pressed.



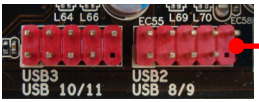
Header	Pin	Signal
HD_LED	1	HD_PWR
	3	HD Active
PWRLED	2	PWR LED+
	4	PWR LED-
RESET	5	Ground
	7	RST BTN
PWRSW	6	PWR BTN
	8	Ground
No Connect	9	+5V
Empty	10	Empty

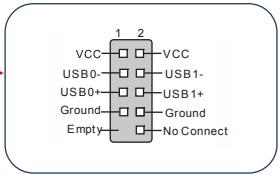
USB2.0 Headers

This mainboard contains four (4) USB 2.0 ports that are exposed on the rear panel of the chassis. This mainboard also contains four 10-pin onboard header connectors that can be used to connect to eight (8) external USB 2.0 devices.

Refer to the following steps:

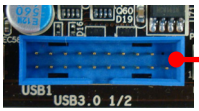
1. Secure the bracket to either the front or rear panel of your chassis (not all chassis are equipped with the front panel option).
2. Connect the cable(s) to the USB 2.0 header on the mainboard.

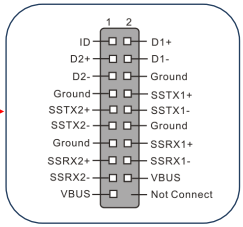




USB3.0 Headers

This mainboard contains Two (2) USB 3.0 ports that are exposed on the rear panel of the chassis. This mainboard also contains one onboard header connectors that can be used to connect to two (2) external USB 3.0 devices.





This mainboard is provided optional USB3.0 front panel cable accessories

For real panel, refer to the following steps:

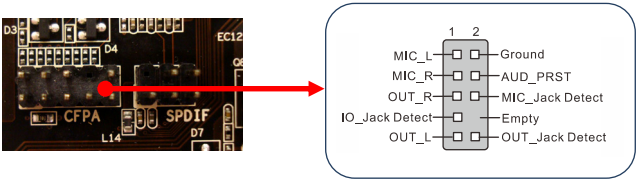
1. Secure the bracket to rear panel of your chassis.
2. Connect the cable(s) to the USB 3.0 header on the mainboard.

For front panel, refer to the following steps:

1. Remove the cover plate from the selected drive bay.
2. Push the USB3.0 cable into the drive bay. Align the screw holes with the appropriate holes in the drive bay and tighten the mounting screws.
3. Connect the USB3.0 connector of cable to the USB3.0 header on the mainboard.

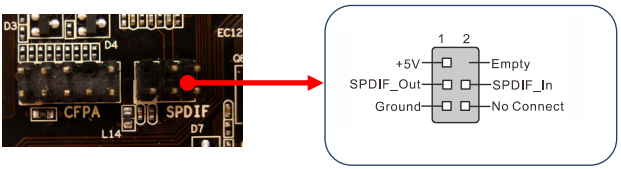
CFPA Header

This header allows you to connect the front panel audio. The audio connector supports HD audio standard.



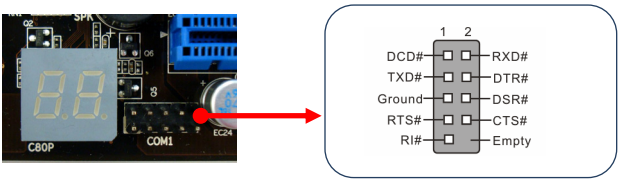
S/PDIF Header

This header is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



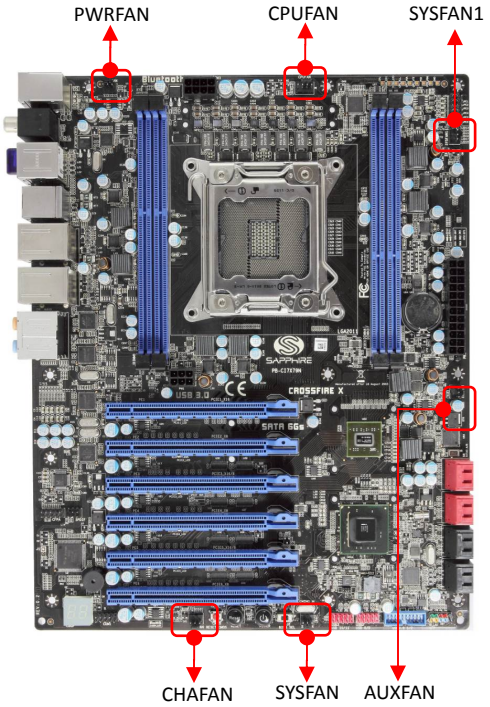
Serial Port Header

The Serial port header (COM1) can provide one serial port via an optional COM port cable.



Fan Headers

There are six fan headers (CPUFAN, SYSFAN, SYSFAN1, PWRFAN, CHAFAN, AUXFAN) on the motherboard. Three of these fans (CPUFAN, PWRFAN, CHAFAN) can be speed detected/controlled and displayed in the Hardware Health Configuration section of the CMOS Setup. The fans are automatically turned off after the system enters S3, S4 or S5 mode.



CPUFAN

Note:
The CPU fan cable can be either a 3-pin or a 4-pin connector. Connect a 3-pin connector to pins 1, 2, and 3on the mainboard connector.

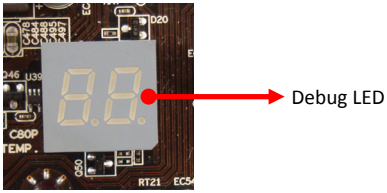
PWRFAN / CHAFAN

SYSFAN / SYSFAN1 / AUXFAN

2-8 Diagnostics LED

This mainboard provides a two-digit POST code to show why the system may be failing to boot. It is useful during a troubleshooting situation. This Debug LED will also display the current CPU temperature after the system has fully booted into the operating system.

Please find a list of debug codes at the end of this manual.



2-9 LED Status Indicators

This mainboard provides three LEDs to indicate the system's status.

- DIMM LED (LED10, Yellow): When the Memory slot is functional: This LED is on.
- POWER LED (LED11, Green): When the System is powered on: This LED is on.
- STANDBY LED (LED12, Blue): When the System is in Standby Mode: This LED is on. This LED will remain on as long as the motherboard is receiving constant power.

2-10 Onboard Buttons

These onboard buttons include Clear CMOS, RESET and POWER, which allow you to easily clear the CMOS, reset the system and turn on/off the system.

Clear CMOS Button

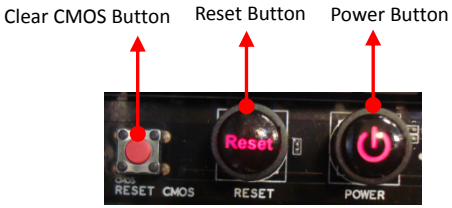
The mainboard uses the CMOS RAM to store some of the system configuration. The CMOS can be cleared by pressing the Clear CMOS button.

Reset and Power Button

These onboard buttons allow you to easily turn on/off the system and allow for easy debugging and testing of the system during troubleshooting situations.

The Reset button with LED indicates the activity status of the hard disk drives and will blink accordingly.

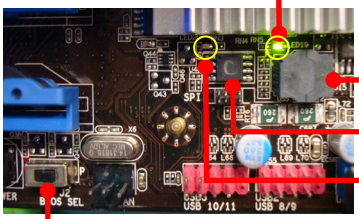
The Power button with LED indicates the system's status. When the system is powered on, the LED blinks red.



2-11 Dual BIOS Switch

This mainboard includes dual onboard BIOS, (Primary and Secondary BIOS), When the primary BIOS is corrupted or has failed, you can use the secondary BIOS to take over on the next system boot to ensure normal system operation.

- **To enable the secondary BIOS**, please refer to the following steps:
  1. Turn off the system power.
  2. Change the BIOS select switch from "P" to "S" position.
  3. Turn on the system power.



- **Recover BIOS:**

  If the primary (secondary) BIOS is corrupted or failed, you can use the USB pen drive or AMI Windows flash utility to do flashing BIOS process to recover the primary (secondary) BIOS.

  Recover primary BIOS steps:

  - Enable the secondary BIOS following steps 1-3 above to power on the system.
  - Change the BIOS select switch from "S" to "P" position before flashing BIOS.
  - Flash the BIOS using either USB pen drive under DOS or AMI Windows flash utility under Windows.

  Recover secondary BIOS steps:

  - Enable the primary BIOS following steps 1-3 above to power on the system, except move the BIOS select switch from "S" to "P" position.
  - Change the BIOS select switch from "P" to "S" position before flashing BIOS.
  - Flash the BIOS using either USB pen drive under DOS or AMI Windows flash utility under Windows.
  - Change the BIOS select switch from "S" to "P", back to the original default.

You also can use S_BIOS Flash Utility to flash BIOS. Please refer to "4-4 S_BIOS Flash Utility" section for detail.

Chapter 3 Configuring the BIOS

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

3-1 Select Boot Device

Select Boot Device Menu allows you to set the first boot device without entering BIOS Setup.

During Power On Self Test (POST), you can press the <**F7**> key to enter select boot device menu. The system will directly boot from the device configured in Boot Menu.

3-2 Enter BIOS Setup

The BIOS is the communication bridge between hardware and software. Correctly setting the BIOS parameters is critical to maintain optimal system performance.

Use the following procedure to change BIOS settings.

1. Power on the computer.
2. Press the <**Del**> or <**F2**> key when the following message briefly shows

upon the bottom of the display during Power On Self Test (POST).

Press F1 to continue, DEL to enter Setup.

Pressing Del takes you to the BIOS Setup Utility.

Note1: It is strongly recommended that you do not change the default BIOS settings. Changing some settings could damage your computer.

Note2: The BIOS options in this manual are for reference only. BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version from our official website

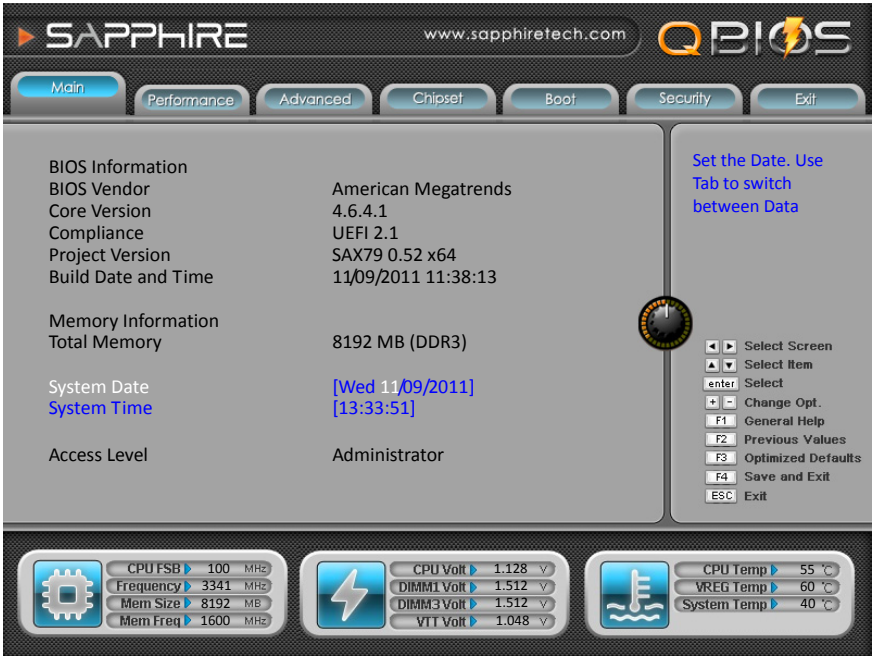
ControlKeys

Please check the following table for the function description of each Controlkey. You can also use the mouse to click your required item.

Control Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F2>	To load previous values for all the settings
<F3>	To load optimal default values for all the settings
<F4>	To save changes and exit the SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3-3 Main Menu

When entering the BIOS Setup Utility, the main menu screen appears. This main menu includes the system overview and displays the basic system configuration, such as BIOS information, memory size and system date/time.



BIOS Information

This field displays the current BIOS version, build date and ID information etc..

Memory Information

Displays current system memory size.

System Date

Allows you to set the system date.The format is <Day><Month><Date><Year>.

[Day] Weekday from Sun. to Sat., this is automatically displayed by BIOS.
[Month] The month from 1 to 12.
[Date] The date from 1 to 31 can be keyed by numeric function keys.
[Year] The year can be adjusted by users.

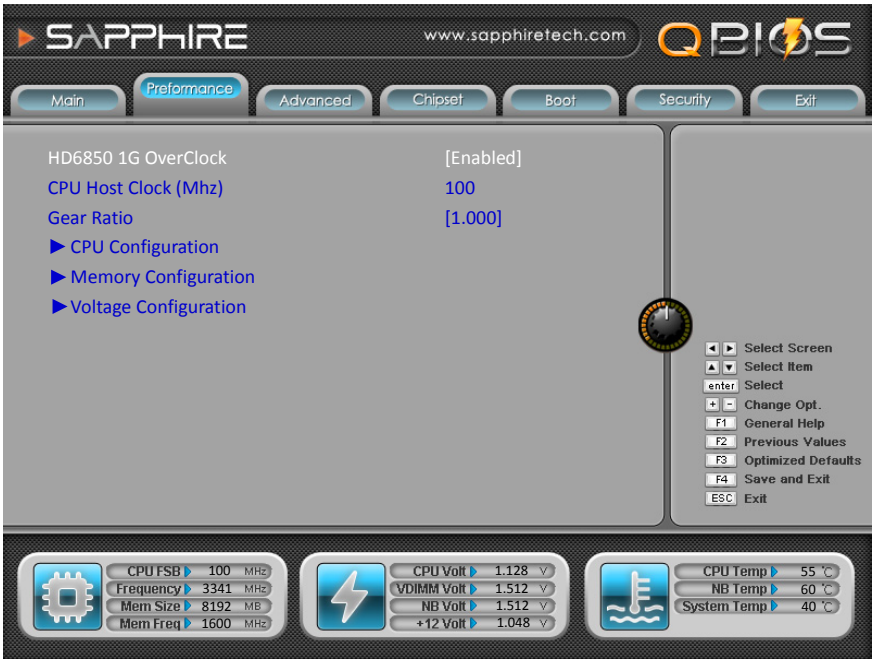
System Time

Allows you to set the system time. The time format is <hour>:<minute>:<second>.

Access Level
This item is used to limit the user access level.

3-4 Performance Menu

The Performance menu allows you to specify your settings for CPU, memory, voltage control and overclocking. Press <Enter> to display the configuration options.



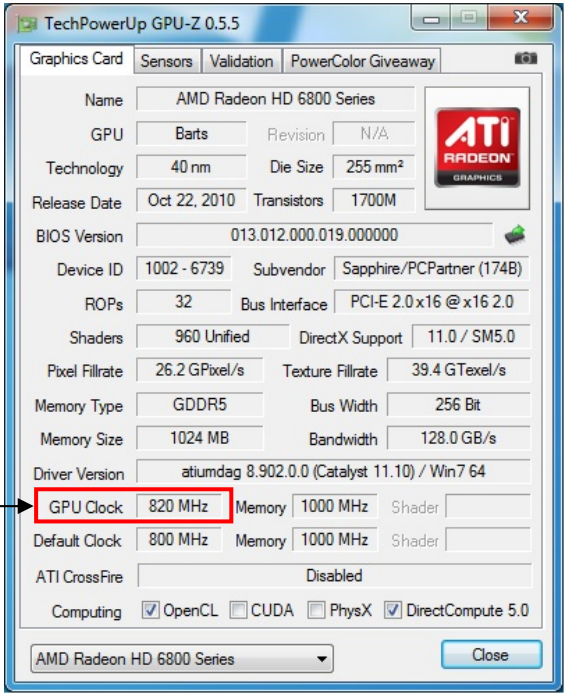
HD6850 1G OverClock
Allow you to enable the overclock function for HD6850 VGA card.
Options: Enabled, Disabled.

If you use 2G memory of VGA card, the BIOS item will be shown "HD6850 2G OverClock". The default GPU clock is 800MHz, it will go to 820MHz after overclocking.

This item will only appear when using the Sapphire HD 6850 Black Diamond Edition VGA card and coming models.

Note:
This function doesn't support overclocking, when using CrossFireX technology to support multiple graphic cards.

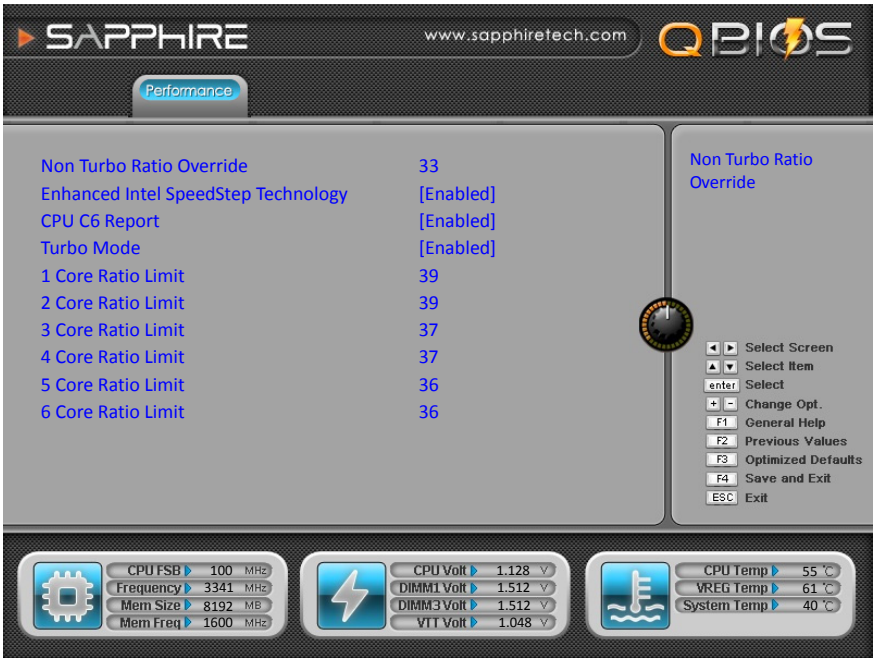
After overclocking,
the GPU Clock is 820 MHZ.



CPU Host Clock (Mhz)
This item allows you to select the CPU host clock (in MHz).
Options: 100 ~ 110.

Gear Ratio
This item allows you to select the Gear Ratio.
Options: 1.000, 1.250, 1.667, 2.500.

CPU Configuration



Non Turbo Ratio Override

This is used to select the Ratio or Multiplier of the CPU, this varies depending on what CPU you have.

Enhanced Intel SpeedStep Technology

Enables the Intel® SpeedStep technology (EIST).

Options: Enabled, Disabled.

CPU C6 report

Enable/Disable CPU C6 (ACPI C3) report to OS

Options: Enabled, Disabled.

Turbo Mode

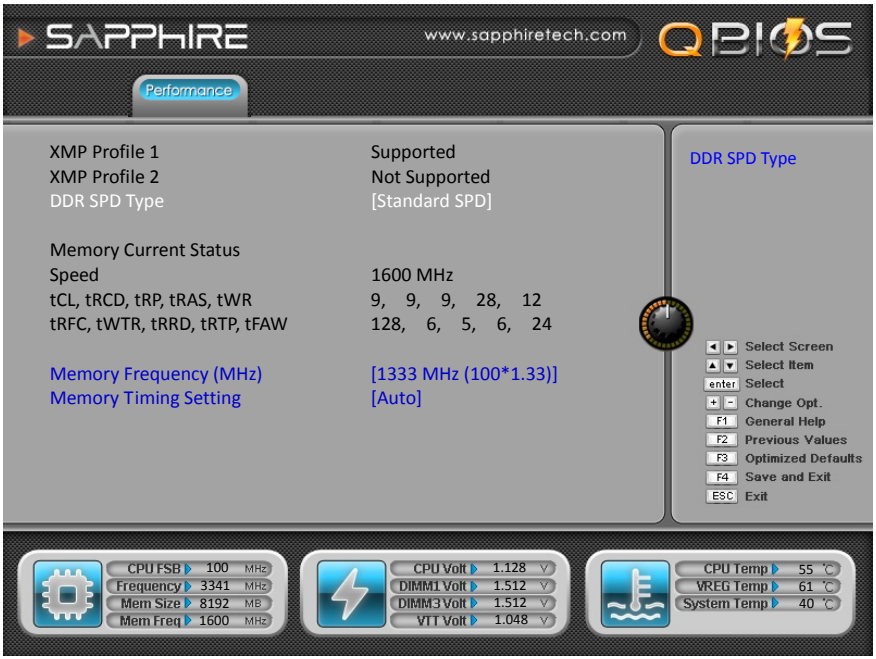
Enables the processor cores to run faster than marked frequency in specification condition.

Options: Enabled, Disabled.

1/2/3/4/5/6 Core Ratio Limit

Displays the 1/2/3/4/5/6 core ratio limit of CPU.

Memory Configuration



XMP Profile 1/2

These items display the current status of the X.M.P support information.

DDR SPD Type

Allows the BIOS to read the SPD data on memory module to enhance memory performance or select manually configuring timings.

Options: Standard SPD, User defined.

Memory Frequency (MHz)

Allows you to select the system memory Frequency.

Options: 1067 MHz (100*1.06), 1333 MHz (100*1.33), 1600 MHz (100*1.60), 1867 MHz (100*1.86), 2133 MHz (100*2.13), 2400 MHz (100*2.40).

Memory Timing Setting

Setting to [Auto] enables timings to be determined by BIOS based on the SPD.

Setting to [Manual] allows users to configure the DRAM timings.

CAS# Latency (tCL)

Set the CAS latency time.

Options: Auto(9), 3 ~ 15.

RAS# to CAS# Delay(tRCD)
Set the RAS to CAS Delay time for Read/Write commands to the same bank.
Options: Auto(9), 3 ~ 15.

Row Precharge Time(tRP)
Set the Row Precharge time. This is the Precharge-to-Active or Auto-to-Refresh of the same bank.
Options: Auto(9), 3 ~ 15.

RAS# Active Time(tRAS)
Set the minimum RAS# active time.
Options: Auto(28), 9 ~ 63.

Write Recovery Time(tWR)
Set the internal Write to Read recovery time.
Options: Auto(12), 3 ~ 31.

Row Refresh Cycle Time(tRFC)
Set the minimum refresh recovery time.
Options: Auto(128), 15 ~ 255.

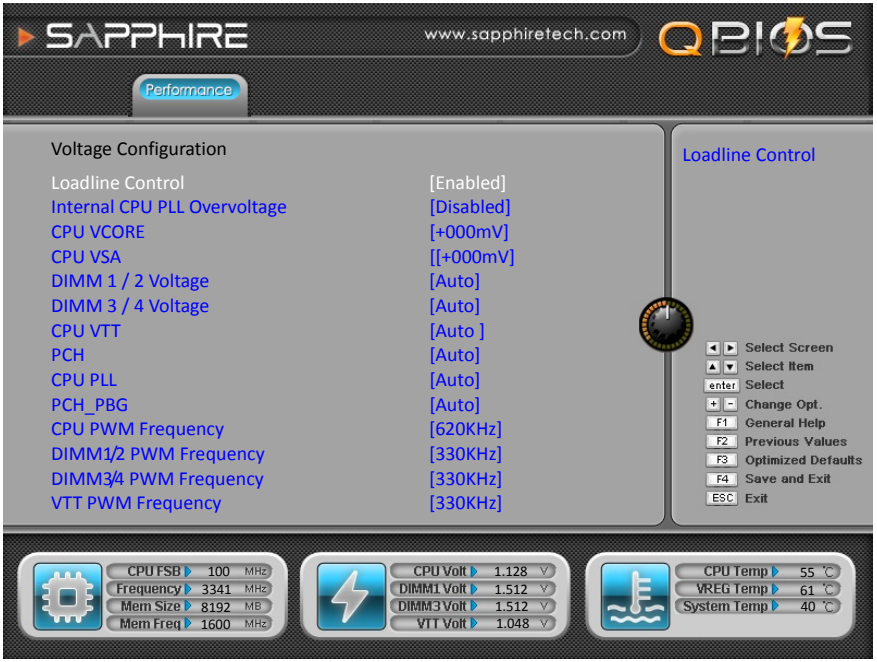
Write to Read Delay(tWTR)
Set the internal Write to Read command delay.
Options: Auto(6), 3 ~ 31.

Active to Active Delay(tRRD)
Set the Row Active to Row Active delay.
Options: Auto(5), 4 ~ 15.

Read CAS# Precharge(tRTP)
Set the Read to Precharge delay.
Options: Auto(6), 4 ~ 15.

Four Active Windows Delay(tFAW)
Set the Four Active Windows Delay.
Options: Auto(24), 4 ~ 63.

Voltage Configuration



Loadline Control
Loadline Control function is a safety measure to protect the CPU.
Options: Enabled, Disabled.

Internal CPU PLL Overvoltage
Allows you to enable the Internal CPU PLL Overvoltage.
Options: Enabled, Disabled.

CPU VCORE
Allows you to adjust the CPU Vcore voltage.
Options: +000mv ~+800mV in 10mV increments.

CPU VSA
Allows you to adjust the CPU VSA Voltage.
Options: +000mv ~+630mV in 10mV increments.

DIMM 1 / 2 Voltage
Allows you to adjust the DIMM1 and DIMM2 Slots voltage.
Options: Auto, 1.10V ~2.50V in 0.01V.

DIMM 3 / 4 Voltage
Allows you to adjust the DIMM3 and DIMM4 Slots voltage.
Options: Auto, 1.10V ~2.50V in 0.01V.

CPU VTT
Allows you to adjust the CPU VTT voltage.
Options: Auto, 1.050V ~2.000V in 0.025V increment

PCH
Allows you to adjust the Intel PCH VCore Voltage.
Options: Auto, 1.10V ~1.72V in 0.01 increments.

CPU PLL
Allows you to adjust the CPU PLL VCore Voltage .
Options: Auto, 1.050V ~2.800V in 0.025V.

PCH_PBG
Allows you to adjust the Intel PCH_PBG VCore Voltage.
Options: Auto, 1.500V ~2.800V in 0.025V.

CPU PWM Frequency
Allows you to adjust the CPU PWM Frequency.
Options: 620KHz, 950KHz.

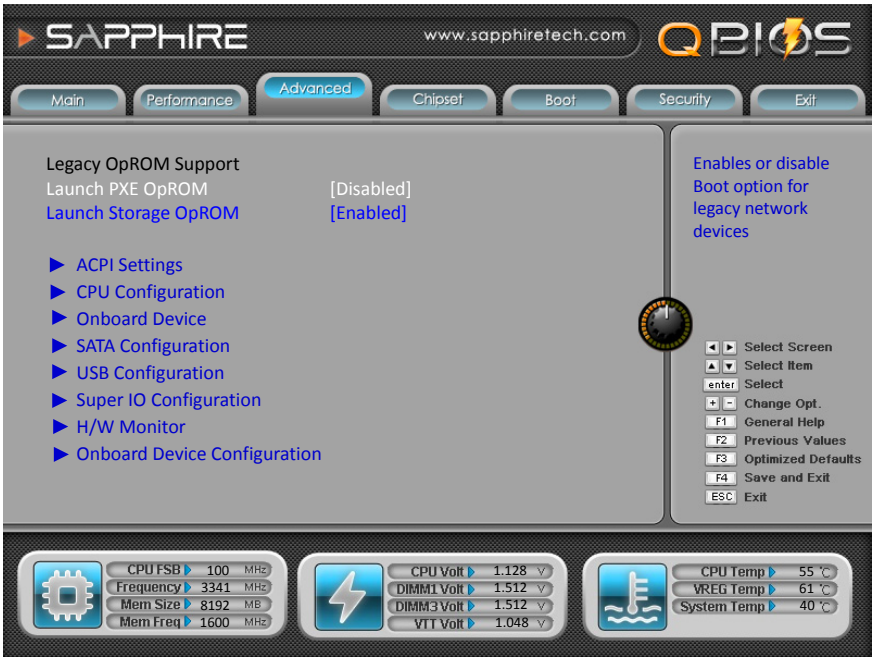
DIMM1/2 PWM Frequency
Allows you to adjust the DIMM1/2 PWM Frequency.
Options: 330KHz, 500KHz.

DIMM3/4 PWM Frequency
Allows you to adjust the DIMM3/4 PWM Frequency.
Options: 330KHz, 500KHz.

VTT PWM Frequency
Allows you to adjust the VTT PWM Frequency.
Options: 330KHz, 500KHz.

3-5 Advanced Menu

The Advanced menu items allow you to change the settings for the CPU, USB and other system devices. Press <Enter> to display the configuration options.



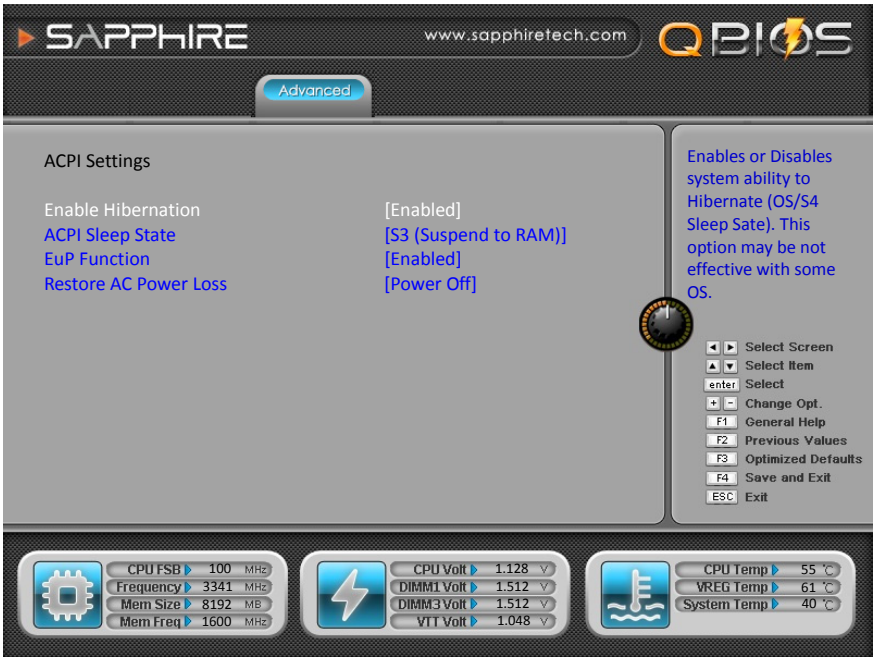
Launch PXE OpROM

Enables the Boot option for legacy network devices.
Options: Enabled, Disabled.

Launch Storage OpROM

Enables the Boot option for mass storage devices with option ROM.
Options: Enabled, Disabled.

ACPI Settings



Enable Hibernation

Enables system ability to Hibernate (OS/S4 Sleep Sate). This option may be not effective with some OS.

Options: Enabled, Disabled.

ACPI Sleep State

Selects the power saving modes for ACPI function.

Options: Suspend Disabled, S1 (CPU Stop Clock), S3 (Suspend to RAM).

EuP Function

Enables the EuP (Energy Using Products) function, allows BIOS to switch off some power at S5 state to get system ready for the EuP requirement to reduce power consumption.

Options: Enabled, Disabled.

Restore on AC Power Loss

Enables your computer to automatically restart or return to its last operating status after power returns from a power failure.

Options: Power off, Power on, Last State.

CPU Configuration

Hyper-threading
This item enables the Intel Hyper-Threading technology.
Options: Enabled, Disabled.

Active Processor Cores
Use this item to select the number of cores to enable in each processor package.
Options: All, 1, 2, 3, 4, 5.

Limit CPUID Maximum
We recommend leaving it disabled, unless you are using a very old OS or experiencing problems related to CPU identification/compatibility.
Options: Enabled, Disabled.

Execute Disable Bit
When this function is disabled, it forces the XD feature flag to always return to zero (0).
Options: Enabled, Disabled.

Hardware Prefetcher
This item enables L2 Cache (Mid Level Cache) stream prefetcher for tuning performance of the specific application.

Options: Enabled, Disabled.

Adjacent Cache Line Prefetch

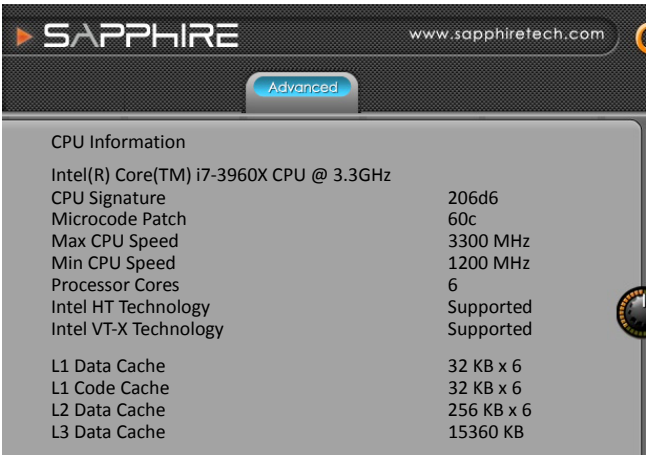
This item enables Adjacent Cache Line Prefetch function.
Options: Enabled, Disabled.

Intel Virtualization Technology

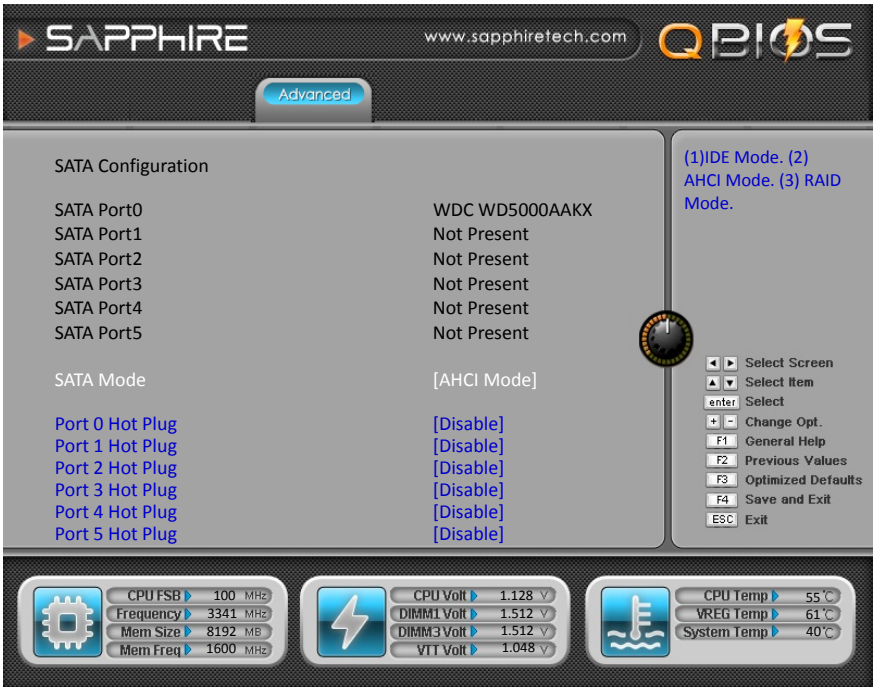
When this function is enabled, it allows a VMM to utilize the additional hardware capabilities provided by Intel Virtualization Technology.
Options: Enabled, Disabled.

- **CPU Information**

  Displays the CPU related information.



SATA Configuration



SATA Port0 ~ SATA Port5

This filed show SATA ports connection state.

SATA Mode

Allows you to set the onboard Serial SATA type.

Options: Disabled, RAID Mode, AHCI Mode, IDE Mode.

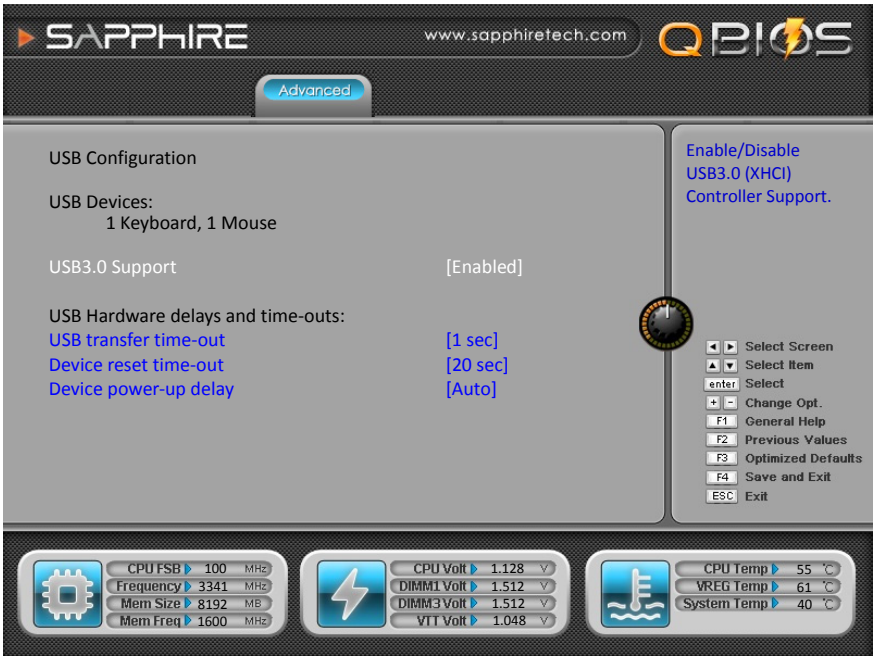
- IDE Mode: Use the SATA hard disk drivers as Parallel ATA storage devices.
- RAID Mode: Create a RAID 0, 1, 0+1, 5 configuration
- AHCI Mode: Use the AHCI (Advanced Host Controller Interface) to enable advanced SATA features for improved performance with NCQ and Hot-plug features

Port 0 Hot Plug ~ Port 5 Hot Plug

Allows you to enable the SATA port hot plug support.

Options: Enabled, Disabled.

USB Configuration



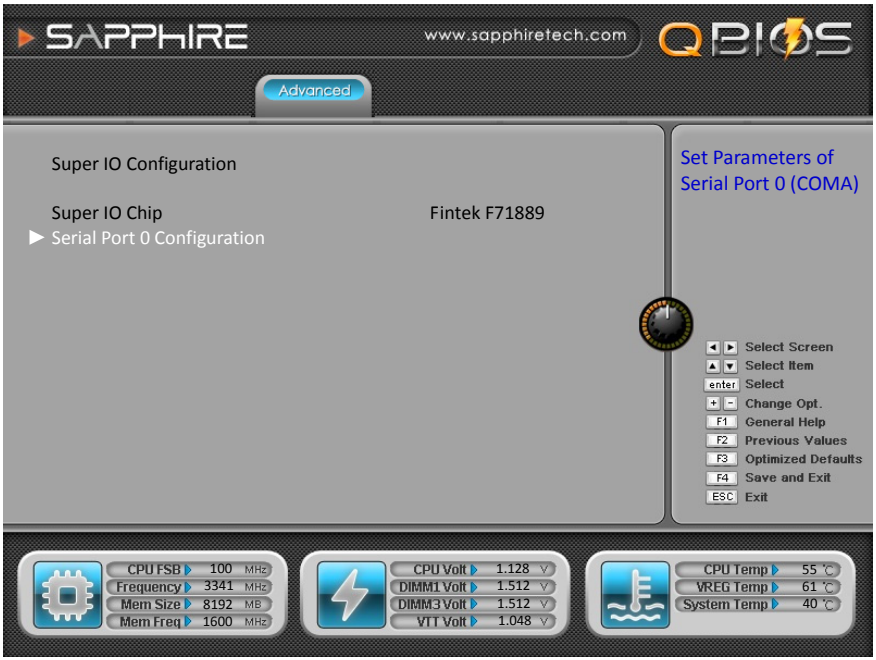
USB3.0 Support
Enables USB3.0 (XHCI) controller support.
Options: Enabled, Disabled.

USB transfer time-out
The time-out value for control, bulk, and interrupt transfers.
Options: 1 sec, 5 sec, 10 sec, 20 sec.

Device reset time-out
Sets USB mass storage devices start unit command time-out.
Options: 10 sec, 20 sec, 30 sec, 40 sec.

Device power-up delay
Maximum time the device will take before it properly reports itself to the Host controller. 'Auto' uses default values; for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.
Options: Auto, Manual.

Super IO Configuration



Serial Port 0 Configuration

Serial Port

Enables the Serial Port support.

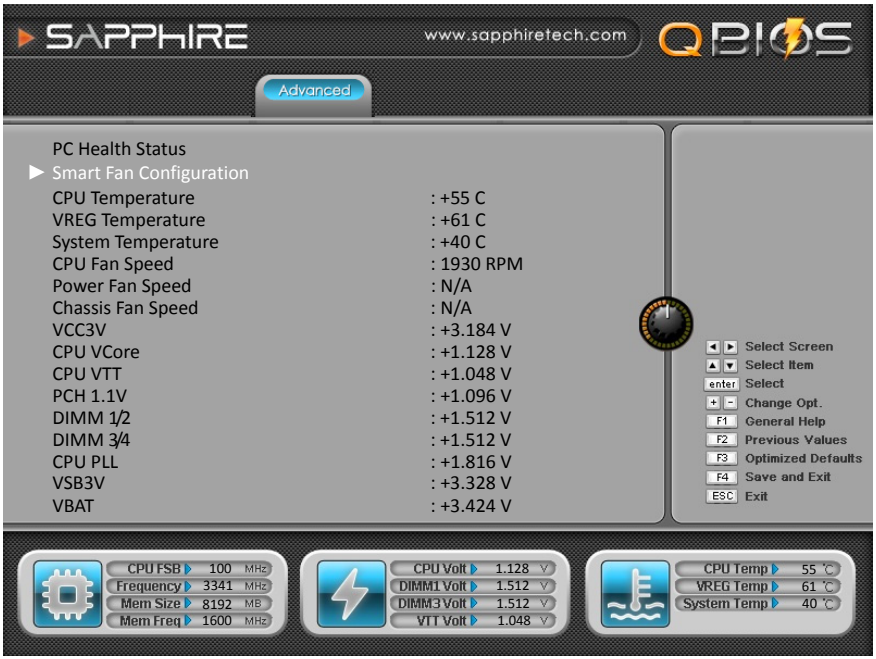
Options: Enabled, Disabled.

Change Settings

Select an optimal setting for super I/O device.

Options: Auto, IO=3F8H; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,10,11,12;

H/W Monitor



CPU / VREG/ System

Displays the current CPU, onboard regulator and system temperature.

CPU /Power /Chassis Fan Speed

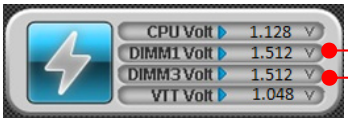
Displays the current CPU, Power and Chassiss Fan Speed

VCC3V/CPU VCore/CPU VTT/PCH 1.1V/DIMM 1/2/ DIMM 3/4 /CPU PLL/ VSB3V/VBAT

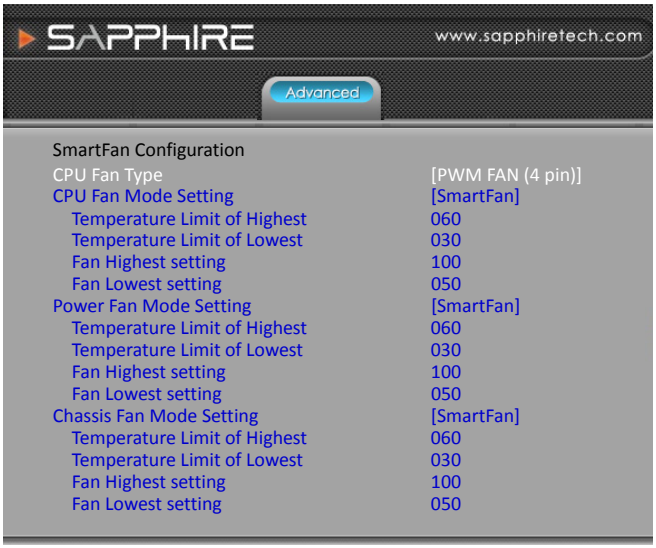
The current voltages are automatically detected and displayed by the system.

Note:

Due to the length limit, the memory voltage of description has been shortened.



▶ Smart Fan Configuration



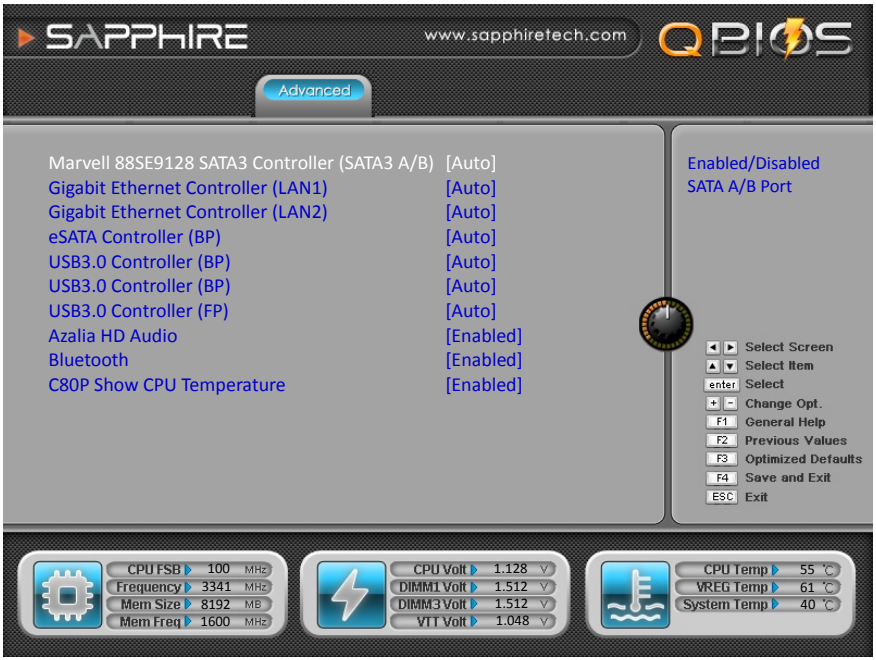
CPU Fan Type

Allows you to select the CPU Fan type.
Options: PWM FAN (4 pin), Linear FAN (3 pin)

CPU Fan Mode Setting

This item controls the speed of the various fans on the motherboard. Choose [SmartFan] when you want the speed of the fans automatically controlled based on temperature. To set the fan speed to a constant rate, select [Manual Mode] and then enter the speed from 0% to 100%.
Set the desired speed for the Power and Chassis fans from 0% to 100%. The system defaults to 100%.

Onboard Device Configuration



Marvell 88SE9128 SATA3 Controller (SATA3 A/B)
Enables the onboard Marvell SATA3 controller (SATA3 A/B).
Options: Auto, Enabled, Disabled.

Gigabit Ethernet Controller (LAN1/LAN2)
Enables the onboard Giga Lan 1 / 2 function for LAN.
Options: Auto, Enabled, Disabled

eSATA Controller (BP)
Enables the onboard eSATA controller of back panel.
Options: Auto, Enabled, Disabled.

USB3.0 Controller (BP)
Enables the onboard one of two USB 3.0 controller of back panel.
Options: Auto, Enabled, Disabled.

USB3.0 Controller (BP)
Enables the onboard one of two USB 3.0 controller of back panel.
Options: Auto, Enabled, Disabled.

USB3.0 Controller (FP)
Enables the onboard USB 3.0 controller of front panel.
Options: Auto, Enabled, Disabled.

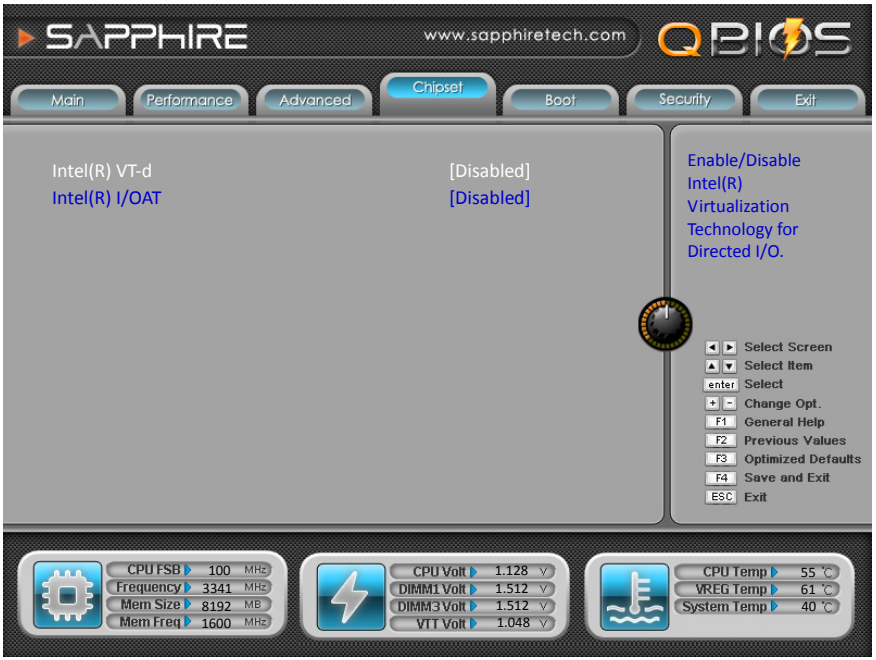
Azalia HD Audio
Enables the onboard High Definition Audio controller.
Options: Enabled, Disabled.

Bluetooth
Enables Bluetooth function.
Options: Enabled, Disabled.

C80P Show CPU Temperature
Enables the onboard POST Port LED to display CPU temperature.
Options: Enabled, Disabled.

3-6 Chipset Menu

The chipset menu items allow you to change the advanced chipset settings. Press <Enter> to display the sub-menu.



Intel(R) VT-d

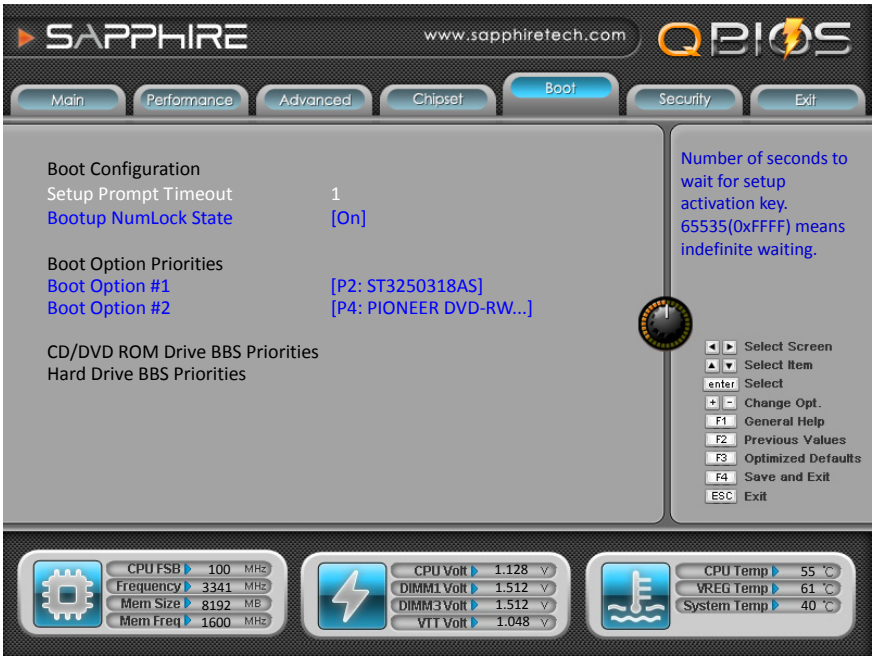
Enables the Intel (R) Virtualization Technology for directed I/O.
Options: Enabled, Disabled.

Intel(R) I/OAT

Enables the Intel (R) I/O Acceleration Technology (I/OAT).
Options: Enabled, Disabled.

3-7 Boot Menu

The Boot menu is used to configure the boot settings and the boot priority.



Setup Prompt Timeout

This is used to set an additional time the POST should wait for the operator to press the key to enter setup. The time is entered in seconds.

Bootup NumLock State

Selects the state of the keyboard's numlock function after POST.
Options: On, Off.

Boot Option Priorities

These options are used to form the boot order and are dynamically generated.

CD/DVD ROM Drive BBS Priorities

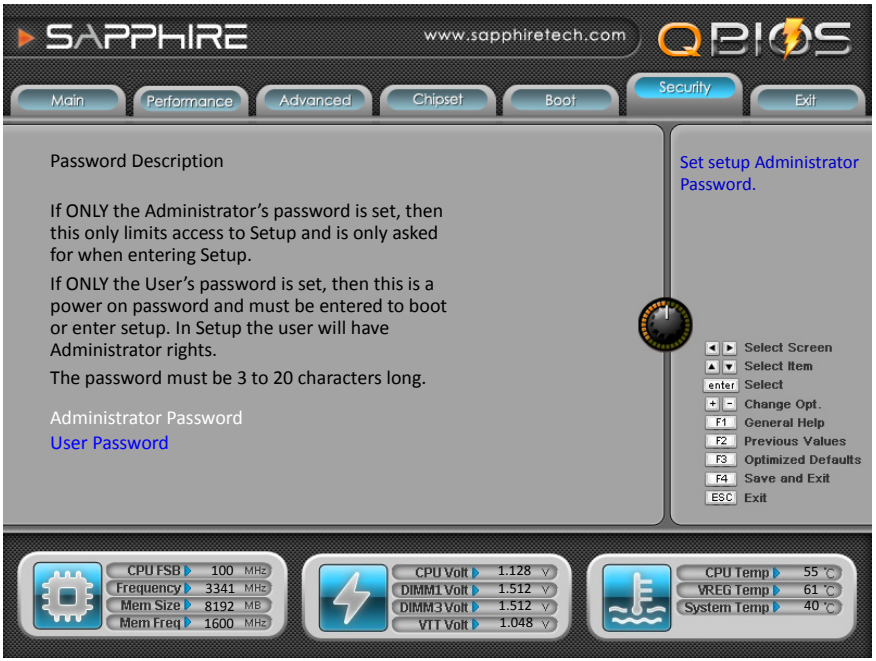
Allows configure the boot order for a specific CD/DVD ROM device class.

Hard Drive BBS Priorities

Allows configure the boot order for a specific Hard Drive device class.

3-8 Security Menu

The Security menu allows you to change the system security settings.



Administrator Password

This function is used to set, change or delete the Administrator password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return. The password must be 3 to 20 characters long.

User Password

This function is used to set, change or delete the User password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return. The password must be 3 to 20 characters long.

3-9 Save & Exit Menu

The Save & Exit menu allows you to load the optimal default values for BIOS, and save or discard your changes to the BIOS items.

Save Changes and Reset

This resets system after saving the changes.

Discard Changes and Reset

This resets system without saving the changes.

Restore Defaults

The restore defaults are the factory settings of this motherboard.

Save as User Defaults

This is used to save all current settings as user default. The current setup state can later be restored using Restore User Defaults.

Restore User Defaults

This is used to restore all tokens to settings previously stored by Save as User Defaults.

Boot Override

This group of functions includes a list, each of them corresponding to one device within the boot order. Select a drive to immediately boot that device regardless of the current boot order.

S_BIOS Flash Utility

This utility allows you to update the system BIOS in embedded BIOS. Please refer to "4-4 S_BIOS Flash Utility" for details.

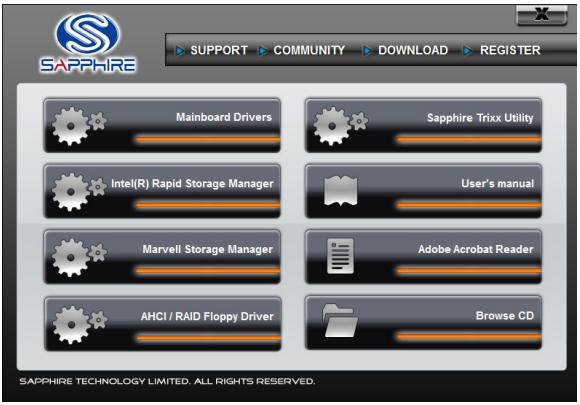
Chapter 4 Driver Installation

After the operating system has been installed, you need to install drivers for this mainboard.

The support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

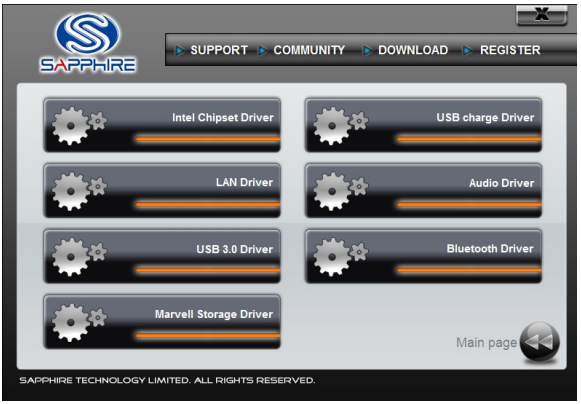
4-1 Driver Install

Insert the bundled driver CD into your optical drive and the main menu will be displayed on your PC screen. Click each item button and select the item you want to install.



<Main Page>

The Mainboard Drivers item shows the available device drivers. Install the necessary drivers to use the devices.



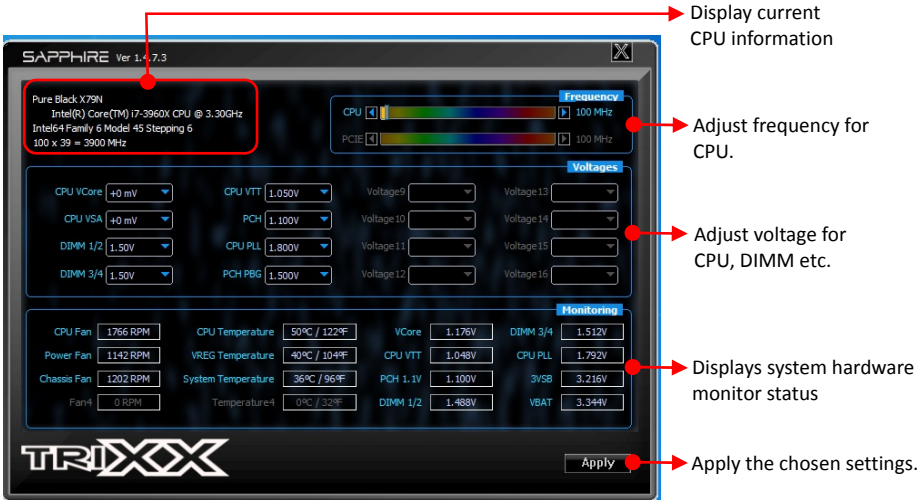
<Mainboard Drivers page>

Note: If Autorun function is not enabled in your computer, browse the contents of the support CD to locate the file autorun.exe, and click this file to run the CD.

4-2 TRIXX Utility

TRIXX is a simple and easy-to-use utility that allows users to adjust system settings for overclocking in a Windows environment. The TRIXX utility includes three configurations for frequency, voltage and hardware monitoring.

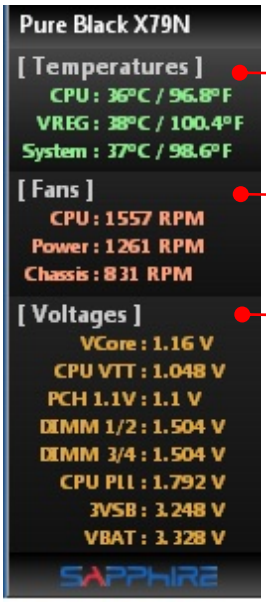
To install TRIXX Utility, run it from the Sapphire Utility page from the bundled DVD. A TRIXX Utility shortcut will be created on the Desktop.



* Actual adjustment options will be different with the picture

4-3 Hardware monitor gadget

This Hardware monitor gadget directly appears in windows screen after TriXX installation is completed. It can be used to help keep track of temperatures of CPU, System and fan speed of CPU, System and voltages of CPU, System.



Displays hardware monitor temperature.

Displays fan speeds.

Displays voltages of system.

4-4 S_BIOS Flash Utility

This mainboard provides a BIOS update tool. The S_BIOS allows you to update the system BIOS without having to enter MS-DOS or Windows environment. Embedded in the BIOS, the S_BIOS is simple and easy-to-use utility to flash BIOS.

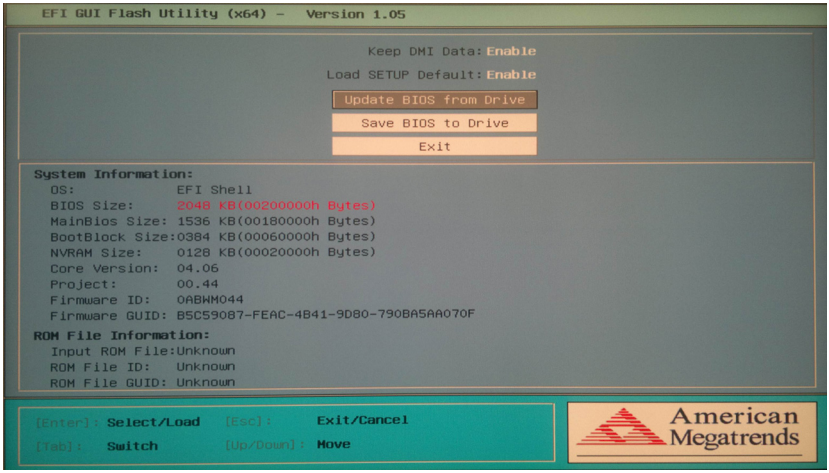
> Note:
> To Flash Secondary BIOS, need to change the BIOS select switch position. Please refer to "2-11 Dual BIOS Switch" section on page 23 for details.

Refer to the following steps for S_BIOS Flash.

Setp1:
Enter BIOS setup screen, select "S_BIOS Flash Utility" item from "Exit" tab.

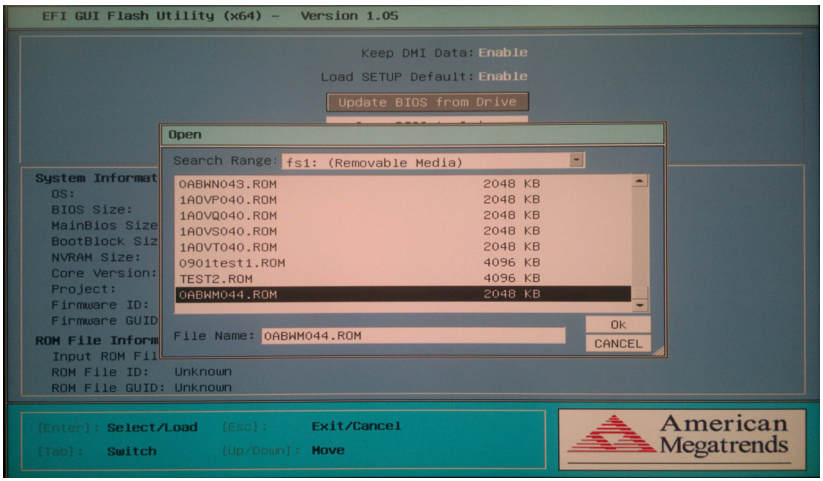
Setp2:
The S-BIOS flash utility allows you to:

- Update BIOS form Drive (please refer to setp3)
- Save BIOS to Drive (please refer to setp6)



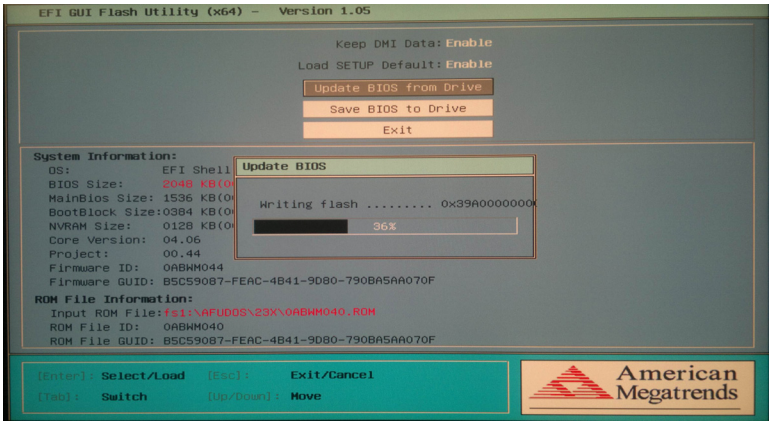
Setp3:

To Update BIOS form Drive, select the BIOS update file and press <OK> to start update. If the BIOS file stored in USB device, please must first insert USB device before turning on the system and **make sure the BIOS update file matches your mainboard model.**



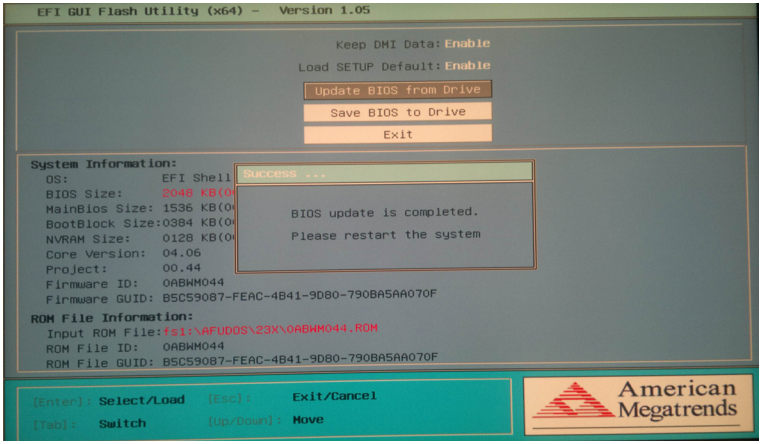
Setp4:

The update BIOS processing screen appears.



Setp5:

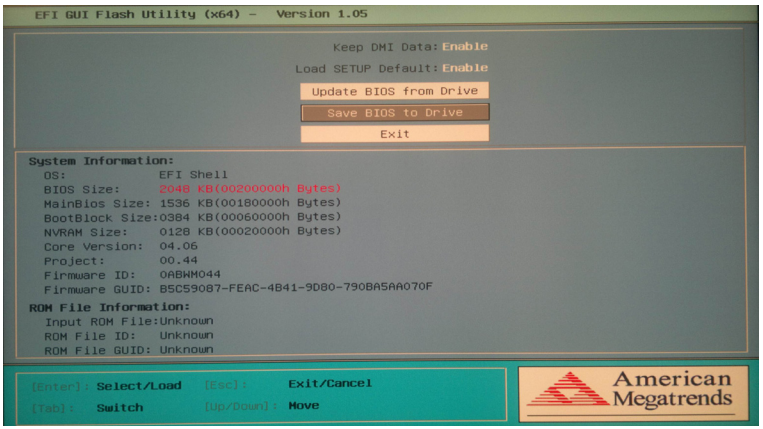
The BIOS update is completed. Please press any key to restart the system.



Setp6:

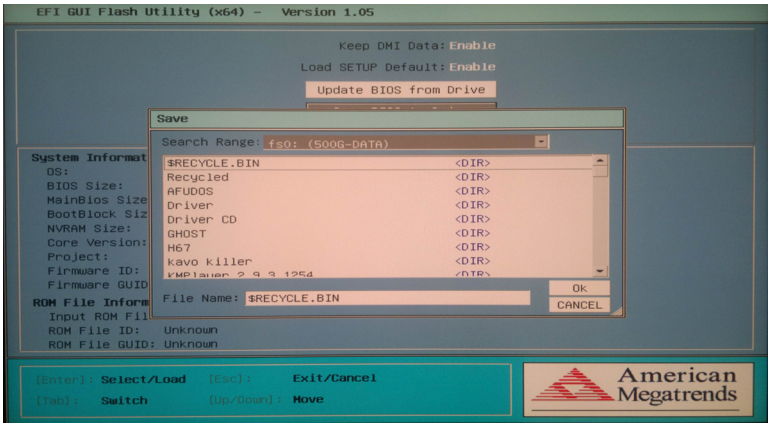
Save BIOS to Drive, allows you to save the current BIOS file.

If the BIOS file stored in USB device, please must first insert USB device before turning on the system.



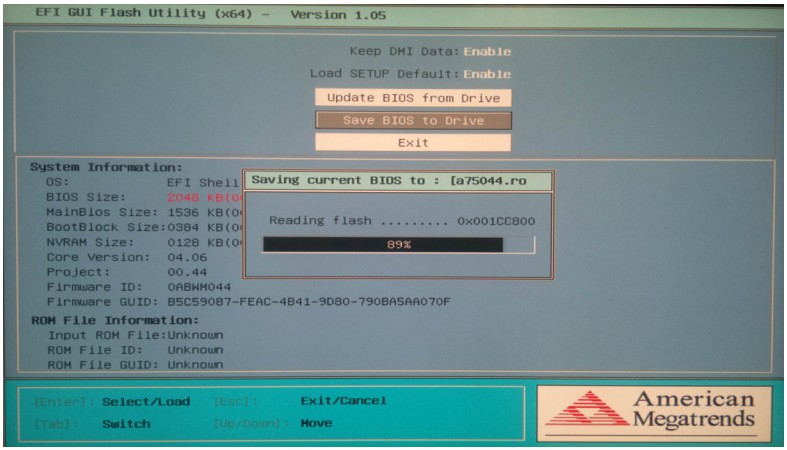
Setp7:

To Save BIOS to Drive, Select the stored location and press <OK> to start saving BIOS file.



Setp8:

After saving BIOS file is completed. Select <Ese> to return “Exit” tab of BIOS setup.



Chapter 5 POST Code

This chapter provides the Aptio POST Codes List for the mainboard during the BIOS pre-boot process.

The POST Codes are displayed on the Debug LED readout located directly onboard the mainboard.

Please refer to following "boot phases", which may apply to various status code & checkpoint descriptions:

- ♦ Security (SEC) – initial low-level initialization
- ♦ Pre-EFI Initialization (PEI) – memory initialization
- ♦ Driver Execution Environment (DXE) – main hardware initialization
- ♦ Boot Device Selection (BDS) – system setup, pre-OS user interface & selecting a bootable device (CD/DVD, HDD, USB, Network, Shell,..)

Checkpoint Ranges

Status Code Range	Description
01 – 0B	SEC execution
0C – 0F	SEC errors
10 – 2F	PEI execution up to and including memory detection
30 – 4F	PEI execution after memory detection
50 – 5F	PEI errors
60 – 8F	DXE execution up to BDS
90 – CF	BDS execution
D0 – DF	DXE errors
E0 – E8	S3 Resume (PEI)
E9 – EF	S3 Resume errors (PEI)
F0 – F8	Recovery (PEI)
F9 – FF	Recovery errors (PEI)

Standard Checkpoints

♦ SEC Phase

Status Code	Description
00	Not used
Progress Codes	
01	Power on. Reset type detection (soft/hard).
02	AP initialization before microcode loading
03	North Bridge initialization before microcode loading
04	South Bridge initialization before microcode loading

05	OEM initialization before microcode loading
06	Microcode loading
07	AP initialization after microcode loading
08	North Bridge initialization after microcode loading
09	South Bridge initialization after microcode loading
0A	OEM initialization after microcode loading
0B	Cache initialization
SEC Error Codes	
0C – 0D	Reserved for future AMI SEC error codes
0E	Microcode not found
0F	Microcode not loaded

♦ PEI Phase

Status Code	Description
Progress Codes	
10	PEI Core is started
11	Pre-memory CPU initialization is started
12– 14	Pre-memory CPU initialization (CPU module specific)
15	Pre-memory North Bridge initialization is started
16	Pre-Memory North Bridge initialization (North Bridge module specific)
17	Pre-Memory North Bridge initialization (North Bridge module specific)
18	Pre-Memory North Bridge initialization (North Bridge module specific)
19	Pre-memory South Bridge initialization is started
1A	Pre-memory South Bridge initialization (South Bridge module specific)
1B	Pre-memory South Bridge initialization (South Bridge module specific)
1C	Pre-memory South Bridge initialization (South Bridge module specific)
1D – 2A	OEM pre-memory initialization codes
2B	Memory initialization. Serial Presence Detect (SPD) data reading
2C	Memory initialization. Memory presence detection
2D	Memory initialization. Programming memory timing information
2E	Memory initialization. Configuring memory
2F	Memory initialization (other).
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32	CPU post-memory initialization is started
33	CPU post-memory initialization. Cache initialization
34	CPU post-memory initialization. Application Processor(s) (AP) initialization
35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
36	CPU post-memory initialization. System Management Mode (SMM) initialization
37	Post-Memory North Bridge initialization is started
38	Post-Memory North Bridge initialization (North Bridge module specific)
39	Post-Memory North Bridge initialization (North Bridge module specific)
3A	Post-Memory North Bridge initialization (North Bridge module specific)
3B	Post-Memory South Bridge initialization is started

3C	Post-Memory South Bridge initialization (South Bridge module specific)
3D	Post-Memory South Bridge initialization (South Bridge module specific)
3E	Post-Memory South Bridge initialization (South Bridge module specific)
3F-4E	OEM post memory initialization codes
4F	DXE IPL is started
PEI Error Codes	
50	Memory initialization error. Invalid memory type or incompatible memory speed
51	Memory initialization error. SPD reading has failed
52	Memory initialization error. Invalid memory size or memory modules do not match.
53	Memory initialization error. No usable memory detected
54	Unspecified memory initialization error.
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	reset PPI is not available
5C-5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
E0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4-E7	Reserved for future AMI progress codes
S3 Resume Error Codes	
E8	S3 Resume Failed
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC-EF	Reserved for future AMI error codes
Recovery Progress Codes	
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5-F7	Reserved for future AMI progress codes
Recovery Error Codes	
F8	Recovery PPI is not available
F9	Recovery capsule is not found
FA	Invalid recovery capsule
FB – FF	Reserved for future AMI error codes

♦ DXE Phase

Status Code	Description
60	DXE Core is started
61	NVRAM initialization
62	Installation of the South Bridge Runtime Services
63	CPU DXE initialization is started
64	CPU DXE initialization (CPU module specific)
65	CPU DXE initialization (CPU module specific)
66	CPU DXE initialization (CPU module specific)
67	CPU DXE initialization (CPU module specific)
68	PCI host bridge initialization
69	North Bridge DXE initialization is started
6A	North Bridge DXE SMM initialization is started
6B	North Bridge DXE initialization (North Bridge module specific)
6C	North Bridge DXE initialization (North Bridge module specific)
6D	North Bridge DXE initialization (North Bridge module specific)
6E	North Bridge DXE initialization (North Bridge module specific)
6F	North Bridge DXE initialization (North Bridge module specific)
70	South Bridge DXE initialization is started
71	South Bridge DXE SMM initialization is started
72	South Bridge devices initialization
73	South Bridge DXE Initialization (South Bridge module specific)
74	South Bridge DXE Initialization (South Bridge module specific)
75	South Bridge DXE Initialization (South Bridge module specific)
76	South Bridge DXE Initialization (South Bridge module specific)
77	South Bridge DXE Initialization (South Bridge module specific)
78	ACPI module initialization
79	CSM initialization
7A – 7F	Reserved for future AMI DXE codes
80 – 8F	OEM DXE initialization codes
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable
9E – 9F	Reserved for future AMI codes
A0	IDE initialization is started

A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8 – BF	Reserved for future AMI codes
C0 – CF	OEM BDS initialization codes
DXE Error Codes	
D0	CPU initialization error
D1	North Bridge initialization error
D2	South Bridge initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (Load Image returned error)
DA	Boot Option is failed (Start Image returned error)
DB	Flash update is failed
DC	Reset protocol is not available